Available online 30 June 2019

International Journal of Medical Studies Print ISSN 2542-2766

Original Article IJMS JUNE 2019/Vol 4/Issue 6

# ANTI-ALLERGIC DRUGS: A REVIEW

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## ABSTRACT

**Background and Objective**

Allergies, also known as allergic diseases, are a number of conditions caused by hypersensitivity of the immune system to something in the environment that usually causes little problem in most people. These diseases include hay fever, food allergies, atopic dermatitis, allergic asthma, and anaphylaxis. Symptoms may include red eyes, an itchy rash, runny nose, shortness of breath, or swelling. Food intolerances and food poisoning are separate conditions.

**Keywords:** Allergy, Autoimmune System, Environmental Conditions.

## INTRODUCTION

Allergies, also known as allergic diseases, are a number of conditions caused by hypersensitivity of the immune system to something in the environment that usually causes little problem in most people. These diseases include hay fever, food allergies, atopic dermatitis, allergic asthma, and anaphylaxis. Symptoms may include red eyes, an itchy rash, runny nose, shortness of breath, or swelling. Food intolerances and food poisoning are separate conditions. An allergy is a reaction by your immune system to something that does not bother most other people. People who have allergies often are sensitive to more than one thing. Substances that often cause reactions are

- Pollen
- Dust mites
- Mold spores

- Pet dander
- Food
- Insect stings
- Medicines

Normally, your immune system fights germs. It is your body's defense system. In most allergic reactions, however, it is responding to a false alarm. Genes and the environment probably both play a role. Agents that are used to treat allergic reactions. Most of these drugs act by preventing the release of inflammatory mediators or inhibiting the actions of released mediators on their target cells. Allergy is defined as a disease following a response by the IMMUNE SYSTEM to an otherwise innocuous agent. This chapter describes the actions of antiallergic drugs and therapeutics on diseases such as allergic rhinitis, atopic dermatitis, allergic conjunctivitis, systemic anaphylaxis, food ALLERGY, allergic asthma and acute urticaria. The putative MECHANISMS OF ACTION of disodium cromoglycate and nedocromil sodium (chromones) are discussed in detail as well as the biochemical and pharmacological effects, clinical applications and unwanted effects of these drugs. The characterisation of histamine receptors is detailed and the MECHANISMS OF ACTION as well as the observed biological effects of H1 and the relatively new H4 receptors are explained. Further, the biochemical and pharmacological effects of anti-IgE therapy are described and recent clinical trials with these drugs are briefly reviewed.

Allergies can cause a variety of symptoms such as a runny nose, sneezing, itching, rashes, swelling, or asthma. Allergies can range from minor to severe. Anaphylaxis is a severe reaction that can be life-threatening. Doctors use skin and blood tests to diagnose allergies. Treatments include medicines, allergy shots, and avoiding the substances that cause the reactions. Common allergens include pollen and food. Metals and other substances may also cause problems. Food, insect stings, and medications are common causes of severe reactions. Their development is due to both genetic and environmental factors. The underlying mechanism involves immunoglobulin E antibodies (IgE), part of the body's immune system, binding to an allergen and then to a receptor on mast cells or basophils where it triggers the release of inflammatory chemicals such as histamine. Diagnosis is typically based on a person's medical history. Further testing of the skin or blood may be

useful in certain cases. Positive tests, however, may not mean there is a significant allergy to the substance in question.

Early exposure to potential allergens may be protective. Treatments for allergies include avoiding known allergens and the use of medications such as steroids and antihistamines. In severe reactions injectable adrenaline (epinephrine) is recommended. Allergen immunotherapy, which gradually exposes people to larger and larger amounts of allergen, is useful for some types of allergies such as hay fever and reactions to insect bites. Its use in food allergies is unclear.

Allergies are common. In the developed world, about 20% of people are affected by allergic rhinitis, about 6% of people have at least one food allergy, and about 20% have atopic dermatitis at some point in time. Depending on the country about 1 and 18% of people have asthma. Anaphylaxis occurs in between 0.05–2% of people. Rates of many allergic diseases appear to be increasing. The word "allergy" was first used by Clemens von Pirquet in 1906.

**ALLERGIC REACTIONS**

Allergies often bring to mind sneezing, a runny nose or watery eyes. While these are symptoms of some types of allergic disease, it’s important to understand that an allergic reaction is actually a result of a chain reaction that begins in your genes and is expressed by your immune system.

**The Immune System**

Your immune system controls how your body defends itself. For instance, if you have an allergy to pollen, your immune system identifies pollen as an invader or allergen. Your immune system overreacts by producing antibodies called Immunoglobulin E (IgE). These antibodies travel to cells that release chemicals, causing an allergic reaction. This reaction usually causes symptoms in the nose, lungs, throat, sinuses, ears, lining of the stomach or on the skin.

Each type of IgE has specific "radar" for each type of allergen. That's why some people are only allergic to cat dander (they only have the IgE antibodies specific to cat dander); while others have allergic reactions to multiple allergens because they have many more types of IgE antibodies.

It is not yet fully understood why some substances trigger allergies and others do not, nor why some people have allergic reactions while others do not. A family history of allergies is the single most important factor that puts you at risk of developing allergic disease.

**Types of Allergic Disease**

Approximately 50 million Americans suffer from some form of allergic disease, and the number is increasing. There are several types of allergic disease, which will be covered briefly here, but you can learn more about each one by visiting the Conditions & Treatments section of the AAAAI website. Allergic rhinitis may be seasonal or year-round. Seasonal allergic rhinitis, often called "hay fever," typically occurs in the spring, summer or fall. Symptoms include sneezing, stuffy or runny nose and itching in the nose, eyes or on the roof of the mouth. When the symptoms are year-round, they may be caused by exposure to indoor allergens such as dust mites, indoor molds or pets. Urticaria, or hives, is characterized by itchy, red bumps that can occur in clumps and be either large or small. Hives are often triggered by certain foods or medications.

Allergic conjunctivitis, or eye allergy, occurs when the eyes react to allergens with symptoms of reddening, itching and swelling. Atopic dermatitis, or eczema, often results from an allergen being exposed to your skin. Symptoms include itching, reddening and flaking or peeling of the skin. Symptoms begin in childhood for 80% of those with atopic dermatitis. Over 50% of those with atopic dermatitis also develop asthma. Asthma is a chronic lung disease characterized by coughing, chest tightness, shortness of breath and wheezing. When you experience asthma symptoms, your inflamed airways become narrowed, making it more difficult to breathe. Up to 78% of those with asthma also have allergic rhinitis. If you have allergies, inhaling allergens may cause increased swelling of your airway lining and further narrowing of your air passages. Asthma may also worsen as a result of respiratory tract infections or exposure to irritants like tobacco smoke. If you have a food allergy, your immune system overreacts to a particular protein found in that food. Symptoms can occur when coming in contact with just a tiny amount of the food. The most common triggers are the proteins in cow's milk, eggs, peanuts, wheat, soy, fish, shellfish and tree nuts.

If you have nasal congestion, facial pressure, cough and thick nasal discharge, you may have rhino sinusitis, which is commonly referred to as sinusitis. Sinusitis is a swelling of the

sinuses, which are hollow cavities within the cheek bones around your eyes and behind your nose. People with allergic rhinitis or asthma are more likely to suffer from chronic sinusitis. This is because the airways are more likely to become inflamed when allergic rhinitis or asthma is present.

**Severe Allergic Reactions**

Anaphylaxis) is a serious, life-threatening allergic reaction. The most common anaphylactic reactions are to foods, insect stings, medications and latex. Anaphylaxis typically affects more than one part of the body at the same time. Symptoms include a feeling of warmth, flushing, a red, itchy rash, feelings of light-headedness, shortness of breath, throat tightness, anxiety, pain/cramps and/or vomiting and diarrhea. In severe cases, you may experience a drop in blood pressure that results in a loss of consciousness and shock. Anaphylaxis requires immediate medical treatment, including an injection of epinephrine and a trip to a hospital emergency room. If it is not treated properly, anaphylaxis can be fatal.

**DIAGNOSING AND TREATING ALLERGIC REACTIONS**

An allergist / immunologist, often referred to as an allergist, is best qualified to treat allergic diseases. To determine if you have an allergy, your allergist will take a thorough medical history and do a physical exam. He or she may perform allergy skin testing, or sometimes blood testing, to determine which substance is causing your allergy. Once your allergy triggers are identified, your allergist can help you establish a treatment plan that is right for you. In many instances, allergy immunotherapy in the form of shots or tablets is an effective, cost-efficient long term treatment approach. While there is not yet a cure for allergic disease, your allergist can properly diagnose the problem and develop a plan to help you feel better and live better.

**SYMPTOMS OF ALLERGY**

**Hay fever, also called allergic rhinitis, may cause**

Sneezing

Itching of the nose

Eyes or roof of the mouth

Runny

Stuffy nose

Watery, red or swollen eyes (conjunctivitis)

**A food allergy may cause**

Tingling mouth

Swelling of the lips, tongue, face or throat

Hives

Anaphylaxis

**An insect sting allergy may cause**

A large area of swelling (edema) at the sting site

Itching or hives all over your body

Cough, chest tightness, wheezing or shortness of breath

Anaphylaxis

**A drug allergy may cause**

Hives

Itchy skin

Rash

Facial swelling

Wheezing

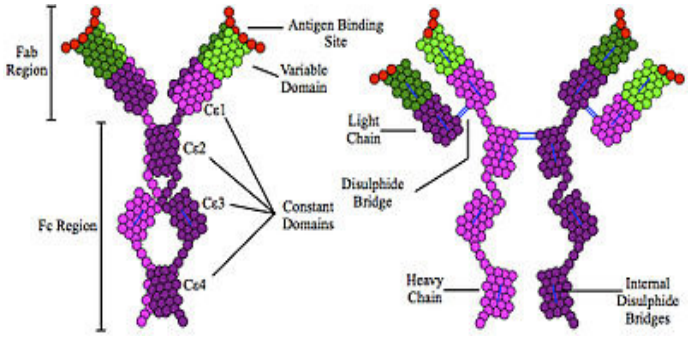
Anaphylaxis

**CAUSE**

Risk factors for allergy can be placed in two general categories, namely host and environmental factors. Host factors include heredity, sex, race, and age, with heredity being by far the most significant. However, there have been recent increases in the incidence of allergic disorders that cannot be explained by genetic factors alone. Four major environmental candidates are alterations in exposure to infectious diseases during early childhood, environmental pollution, allergen levels, and dietary changes.

**MECHANISM OF ACTION**

Immunoglobulin E (IgE) is a kind of antibody (or immunoglobulin (Ig) "isotype") that has only been found in mammals. Monomers of IgE consist of two heavy chains (ε chain) and two light chains, with the ε chain containing 4 Ig-like constant domains (Cε1-Cε4). IgE's main function is immunity to parasites such as helminths[2] like Schistosoma mansoni, Trichinella spiralis, and Fasciola hepatica.[3][4][5] IgE is utilized during immune defense against certain protozoan parasites such as Plasmodium falciparum. IgE also has an essential role in type I hypersensitivity, which manifests various allergic diseases, such as allergic asthma, most types of sinusitis, allergic rhinitis, food allergies, and specific types of chronic urticaria and atopic dermatitis. IgE also plays a pivotal role in responses to allergens, such as: anaphylactic drugs, bee stings, and antigen preparations used in desensitization immunotherapy.




**CONCLUSION**

An allergist / immunologist, often referred to as an allergist, is a pediatrician or internist with at least two additional years of specialized training in the diagnosis and treatment of problems such as allergies, asthma, autoimmune diseases and the evaluation and treatment of patients with recurrent infections, such as immunodeficiency diseases. The right care can make the difference between suffering with an allergic disease and feeling better. By visiting an allergist, you can expect an accurate diagnosis, a treatment plan that works and educational information to help you manage your disease.

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